

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions of claims:

1. (cancelled)

2. (cancelled)

3. (cancelled)

4. (cancelled)

5. (cancelled)

6. (cancelled)

1        7. (previously presented) An electron source comprising:  
2        a cold cathode, wherein the cold cathode is substantially flat;  
3        an evacuated vacuum envelope enclosing the cold cathode;  
4        circuitry for creating an electric field sufficient to cause an electron beam to  
5        be emitted from the cold cathode; and  
6        a window in the evacuated vacuum envelope to permit passage of the electron  
7        beam externally from the envelope.

1        8. (previously presented) A method for operating an electron source,  
2        comprising the step of activating an electric field to cause an emission of an electron  
3        beam from a cold cathode within an evacuated envelope in a manner so that the  
4        electron beam passes externally from the envelope through a window in the envelope,  
5        wherein the cold cathode is substantially flat.

1        9. (original) The method as recited in claim 8, further comprising the step of  
2        positioning an object relative to the electron source so that the electron beam emitted  
3        externally from the electron source irradiates the object, wherein the object is external  
4        to the evacuated envelope.

1        10. (previously presented) The electron source of claim 7, wherein the cold  
2        cathode comprises a plurality of carbon nanotubes.

1           11. (previously presented) The electron source of claim 7, wherein the cold  
2 cathode comprises amorphous diamond emitters.

1           12. (previously presented) The electron source of claim 10, wherein the  
2 plurality of carbon nanotubes comprise single wall nanotubes.

1           13. (previously presented) The electron source of claim 10, wherein the cold  
2 cathode comprises a mixture of amorphous carbon, graphite diamond, and fullerene-  
3 type carbon materials.

1           14. (previously presented) The electron source of claim 7, wherein the  
2 evacuated vacuum envelope is formed within a vessel, wherein the vessel is formed  
3 by a first wall substantially parallel to a second wall, wherein the vessel is formed by  
4 a third wall substantially parallel to a fourth wall, wherein the first wall is  
5 substantially perpendicular to the third wall, wherein the second wall is substantially  
6 perpendicular to the fourth wall, wherein the vessel comprises a fifth wall coupled to  
7 the first, second, third, and fourth walls, wherein the cold cathode is coupled to the  
8 fifth wall, wherein the fifth wall is substantially parallel to the window.

1           15. (previously presented) The method as recited in claim 8, wherein the cold  
2 cathode comprises a plurality of carbon nanotubes.

1           16. (previously presented) The method as recited in claim 8, wherein the cold  
2 cathode comprises amorphous diamond emitters.

1           17. (previously presented) The method as recited in claim 15, wherein the  
2 plurality of carbon nanotubes comprise single-wall nanotubes.

1           18. (previously presented) The method as recited in claim 15, wherein the  
2 cold cathode comprises a mixture of amorphous carbon, graphite diamond, and  
3 fullerene-type carbon materials.

1           19. (previously presented) The method as recited in claim 8, wherein the  
2 evacuated vacuum envelope is formed within a vessel, wherein the vessel is formed  
3 by a first wall substantially parallel to a second wall, wherein the vessel is formed by  
4 a third wall substantially parallel to a fourth wall, wherein the first wall is  
5 substantially perpendicular to the third wall, wherein the second wall is substantially  
6 perpendicular to the fourth wall, wherein the vessel comprises a fifth wall coupled to  
7 the first, second, third, and fourth walls, wherein the cold cathode is coupled to the  
8 fifth wall, wherein the fifth wall is substantially parallel to the window.